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10/802,470	03/17/2004	Masao Asano	KON-1863	4091

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EXAMINER	
DOTE, JANIS L	

ART UNIT	PAPER NUMBER
1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/802,470	ASANO ET AL.	
	Examiner	Art Unit	
	Janis L. Dote	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/26/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

In Fig. 1, the reference character **134**. See the instant specification, pages 7-17.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The disclosure is objected to because of the following informalities:

The use of trademarks, e.g., Coulter counter [sic: COULTER COUNTER] at page 28, line 20, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 20 are indefinite in the phrase "each of the toners . . . has a turbidity of less than 60, and the maximum turbidity difference among the toners is 5-45" because it is not clear what is meant by the term "turbidity," in view of the disclosure and prosecution history in the instant specification. See In re Merat, 186 USPQ 471, 474 (CCPA 1975) (a term that is

first sight definite may become indefinite in light of the supporting disclosure).

The toners exemplified in US application Serial No. 11/247,807 (Application'807), which is a C-I-P of the instant application, appear to be the same toners exemplified in the instant specification. Application'807 reports that its toners have turbidity values that are numerically the same as those reported for the toners in the instant specification. Compare Application'807, Table 2 at page 68, and the instant specification, Table 2 at page 67.

The instant specification at page 17, line 14, to page 18, line 6, defines the term "turbidity" as a haze value, which is defined as the ratio of the ("scattering component"/entire transmission component for incident light) x 100 (percent). According to the instant specification, the turbidity is measured by: (1) dispersing 5.0 g of toner in 50 ml of an aqueous solution containing 1 ml of a surface active agent (Senjoryoku Family, manufactured by Kao Corp); (2) centrifuging at 2,000 rpm for 10 minutes the solution to form a precipitate comprising toner components and a supernatant comprised of "free components"; and (3) measuring the resultant supernatant with a COH-300A instrument, manufactured by Nippon Denshoku Industries Co., Ltd.

However, Application'807 defines the term "turbidity" as a haze value, which is the ratio of a "diffused component to a totally transmitted component for an incident light" x 100. Application'807 further discloses that the turbidity is determined by: (1) diffusing 5 g of toner in 50 ml of a 0.7% aqueous dodecylbenzenesulfonic acid sodium salt solution by stirring the solution with a magnetic stirrer; (2) centrifuging under the conditions of 292 G (1200 rpm) for 10 minutes the solution of step (1) with a particular centrifugal separator; (3) removing 40 ml of the supernatant liquid within 10 minutes after centrifugal separation; and (4) measuring the haze value of the supernatant with a "Haze measuring Equipment employing an integrating sphere" MODEL COH-300A made by Nippon Denshoku Industries Co., Ltd. See Application'807, page 17, line 14, to page 19, line 2.

The definitions of the term "turbidity" in the instant specification and in Application'807 do not appear to be the same. Nor do the methods disclosed in Application'807 and in the instant specification appear to be the same. Therefore, it is not clear how the numerical values of turbidity for apparently the same toners in Application'807 can be the same values reported in the instant specification when the definitions of "turbidity" and methods of determining turbidity

in the instant specification and in Application'870 do not appear to be the same. An explanation is required.

Claim 16 is further indefinite in the phrase "supplying at least one of aluminum stearate, indium stearate, gallium stearate, lithium stearate, magnesium stearate, sodium stearate, aluminum palmitate, and aluminum oleate on the surface of the electrophotgraphic photoreceptor" (emphasis added) because it is not clear whether the claim requires that all eight of the named compounds be applied to the surface or just one. In colloquial informal English, the phrase "at least one of A . . . and Z" can be read as being met by any one of A . . . and Z. More formally, if only one element is required, one might write "at least one of A . . . or Z." Or if all elements were required, one might write "at least one each of A . . . and Z." Clarification, supported by specific disclosure in the originally filed specification, is required.

5. Claim 7 is objected to because of the following informalities:

In claim 7, the noun-verb number mis-match in the phrase "toners comprises."

Appropriate correction is required.

6. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

7. Claims 1–38 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-38 of copending Application No. 11/247,807.

This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1, 7-10, 12, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,837,414 (Kitani), as evidenced by applicants' admissions at page 17, line 14, to page 18, line 8, of the instant specification (applicants' admission I), combined with US 5,652,075 (Kanbayashi), US 6,972,871 B2 (Tsuda), and US 5,262,264 (Shimizu).

Kitani discloses a method for forming a multi-colored image comprising the steps of: (1) forming toner images each different in color superimposed on a photoreceptor drum **14**; and (2) simultaneously transferring the superimposed toner images to a recording medium to form a multi-colored image. Col. 2, lines 24-40; col. 9, line 65, to col. 10, line 2; col. 10, lines 43-56; and Fig. 2. In Fig. 2, the image forming apparatus comprises four developing devices **12**, wherein each device contains a monochromatic toner. Col. 10, lines 30-32. The toners used to form the toner images comprise colored particles,

which comprise a colorant and a binder resin, and fine particles. The toners have a "releasing index" of 10 to 50. Col. 2, lines 17-23.

Kitani does not explicitly disclose that the toners have a "turbidity" as recited in instant claims. However, according to Kitani, the "releasing index" is a measure of the amount of the fine particles adhered electrostatically onto the toner particle. Col. 4. lines 10-13. Kitani teaches that when the releasing index exceeds 50, the amount of the releasing component, i.e., the fine particles, is apt to increase. Col. 5, lines 16-17. Kitani teaches that the "releasing index" is determined by: (1) dispersing 5 g of toner in 50 ml of an aqueous solution of an alkyl benzene sodium sulfate salt; (2) stirring the resultant mixture; (3) centrifuging under the conditions of 300G (2,000 rpm) for 10 minutes the resultant stirred mixture with a particular centrifugal separator; (4) removing 40 ml of the supernatant liquid after the centrifugal separation; and (5) measuring the turbidity of the supernatant with the COH-300A instrument made by Nippon Denshoku Industries Co., Ltd. The "releasing index," i.e., turbidity, is equal to the "scattering component/total transmitted component." Col. 4, line 46, to col. 5, line 10.

The Kitani "releasing index" measurement appears to be

substantially the same as the measurement disclosed in the instant specification for "turbidity." The instant specification at page 18, lines 7-8, discloses that a "higher toner turbidity value implies that free minute particle components such as external additives are in a large amount." The instant specification at page 17, line 14, to page 18, line 6, defines the term "turbidity" as a haze value, which is defined as the ratio of the ("scattering component"/entire transmission component for incident light) x 100 (percent). The turbidity is measured by: (1) dispersing 5.0 g of toner in 50 ml of an aqueous solution containing 1 ml of a surface active agent (Senjoryoku Family, manufactured by Kao Corp); (2) centrifuging at 2,000 rpm for 10 minutes the solution to form a precipitate comprising toner components and a supernatant comprised of "free components"; and (3) measuring the resultant supernatant with a COH-300A instrument, manufactured by Nippon Denshoku Industries Co., Ltd.

The Kitani "releasing index" appears to have the same definition as the "turbidity" parameter recited in the instant claims. Accordingly, it is reasonable to presume that the Kitani "releasing index" property meets the "turbidity" property recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

According to Kitani, its multi-color image forming method provides good transfer of the superimposed color images from the photoreceptor to the recording medium. The method prevents insufficient cleaning of the toner from the photoreceptor in a blade cleaning process. The method prevents toner film formation on the photoreceptor, which in turn prevents the formation of image defects. Col. 2, lines 5-12; col. 5, lines 10-22; and Table 3 at col. 13, for example, developer nos. 1-7.

Kitani does not exemplify the formation of a full color image. However, as discussed above, the apparatus disclosed in Kitani that is used in the multi-color image forming method comprises four developing units, wherein each of the developing units comprise a toner having a "releasing index" of 10 to 50.

It is well known in the art that in electrophotographic color image forming processes of full color images, the full color image is generally reproduced by using three colors of yellow, magenta, and cyan, and optionally, by adding black. See Kanbayashi, col. 1, lines 21-25. Tsuda at col. 1, lines 38-42, discloses that to form a color image it is necessary to superimpose toner images of three colors - cyan, magenta, and yellow plus the color black. Shimizu at col. 1, lines 61-64, discloses that a multicolor toner image obtained by repetitive

development with magenta, cyan, yellow, and black toners is "generally demanded to have an image quality close to natural colors."

Kitani teaches a black toner, a cyan toner, a magenta toner, and a yellow toner. Each of the toners has a volume average particle size of 8.5 μm, which is within the range of the toner particle size limitation recited in instant claim 18. Each of the toners also comprises externally added particles having particle sizes that are within the range of 0.05 to 0.5 μm recited in instant claim 17. Kitani, col. 3, lines 46-47; col. 7, lines 63-67; col. 11, lines 35-49; Table 1 at col. 11; and Table 2 at col. 12, toner nos. 1 and 4-7. The Kitani black toner **1** has a "releasing index" of 15. Kitani teaches a yellow toner **2** having a "releasing index" of 18, and a cyan toner **4** and a magenta toner **3** both having a "releasing index" of 32. See Table 2, toner nos. 1, 4, and 5. Kitani further teaches another yellow toner **2** and another magenta toner **3** both having a "releasing index" of 30, and a further yellow toner **2** and another cyan toner **4** both having a "releasing index" of 35. See Table 2, toner nos. 6 and 7. Each of the exemplified toners has a "releasing index" of less than 40, which meets the turbidity ranges of "less than 60," "less than 50," and "less than 40" recited in instant claims 1, 8, and 10,

respectively. The "releasing index" value of 15 of the black toner **1** is within the turbidity range of "less than 20" recited in instant claim 7.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kitani, Kanbayashi, Tomita, and Shimizu, to use the Kitani black toner **1** of toner no. 1 in combination with the yellow toner **2** in toner no. 4 and the magenta toner **3** and the cyan toner **4** in toner no. 5, or in combination with either the yellow toners **2** in toner nos. 6 or 7 and with the magenta toner **3** in toner no. 6 and the cyan toner **4** in toner no. 7, as the four different color toners in the four developing units in the method disclosed by Kitani to form a full color image. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that provides full color images having an image quality close to natural colors without image defects that are cause by insufficient cleaning of the photoreceptor.

The maximum difference in the "releasing index" between the Kitani black toner **1** in toner no. 1, the yellow toner **2** in toner no. 4, and the magenta toner **3** and cyan toner **4** in toner no. 5 is 17. The maximum difference in the "releasing index" between the Kitani black toner **1** in toner no. 1 with either the yellow toner **2** in toner nos. 6 and 7 with the magenta toner **3** in toner

no. 6 and the cyan toner **4** in toner no. 7 is 20. The maximum releasing index differences of 17 and 20 are with the maximum turbidity difference ranges of 5-45 and 10-35 recited in instant claims 1 and 9, respectively. Thus, the full-color image forming method rendered obvious over the combined teachings of Kitani with the other cited references meets the process steps recited in the instant claims.

11. Claims 2, 3, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu, as applied to claim 1 above, further combined with US 5,485,250 (Kashimura).

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu renders obvious a full color image forming method as described in paragraph 10 above, which is incorporated herein by reference.

Kitani does not exemplify the use of a photoreceptor drum having a surface layer as recited in instant claims 2, 3, and 19.

Kashimura teaches a photoreceptor drum comprising a surface layer comprising 3 parts by weight of a fine tetrafluoroethylene/hexafluoropropylene copolymer powder

dispersed in 5.5 parts by weight of a polycarbonate binder resin. The fine copolymer powder is present in an amount of about 54% by weight based on the weight of the binder resin, which is within the amount range of 0.1 to 90 percent by weight recited in instant claim 3. The Kashimura surface layer has a contact angle to water of 112 degrees, which is within the contact angle range of "at least 90 degrees" recited in instant claim 19. Col. 10, lines 7-13; and example 5 at col. 15, line 32, to col. 16, line 25. The Kashimura surface layer meets the surface layer limitations recited in instant claims 2, 3, and 19. According to Kashimura, the photoreceptor drum provides superior quality images. Col. 2, lines 48-51. Kashimura reports that the photoreceptor drum has a toner transfer efficiency of 96%, and "very good images were obtainable without uneven transfer, blank areas caused by faulty transfer, drive pitch unevenness and color misregistration." Col. 16, lines 25-28.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kashimura, to use the Kashimura photoreceptor drum as the photoreceptor drum in the full-color image forming method rendered obvious over the teachings in Kitani, as evidenced by applicants' admission I, combined with the teachings in Kanbayashi, Tsuda, and Shimizu.

That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that provides superior quality full-color images as disclosed by Kashimura.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu, as applied to claim 1 above, further combined with US 6,160,977 (Takeichi).

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu renders obvious a full color image forming method as described in paragraph 10 above, which is incorporated herein by reference.

Kitani does not exemplify the step of applying a surface energy reducing agent as recited in the instant claims. However, according to Kitani, after transferring the superimposed toner images to a recording material, the photoreceptor drum **14** can be cleaned with a cleaning device **13** to remove toner remaining on the photoreceptor drum. Col. 2, lines 38-40; and col. 10, lines 32-33.

Takeichi discloses a lubricant applying device that is capable of constantly applying a lubricant to the surface of the

image carrier, i.e., the photoreceptor drum, in an image forming apparatus without any waste. Col. 2, lines 13-16. According to Takeichi, said lubricant applying device applies "a lubricant to an image carrier in a desired manner at all times and allows the lubricant to be used up with a low cost compact construction." The lubricant applying device prevents the wear of the image carrier such that the image carrier can form desirable images over a long period of time. Col. 9, line 66, to col. 10, line 6. Takeichi disclose a cleaning unit **23**, which comprises a brush **231** and a cleaning blade **232**. The brush **231** plays the role of a lubricant applying device. Figs. 2A and 2C; and col. 3, line 61, to col. 4, line 36. According to Takeichi, the lubricant is applied to the photoreceptor drum such that the coefficient of static friction on the surface of the drum is between 0.008 to 0.4. Col. 4, lines 57-59. Takeichi teaches that the lubricant can be a solid lubricant such as polytetrafluoroethylene powder or zinc stearate and similar fatty acid metal salts. Col. 7, lines 56-62.

It would have been obvious for a person having ordinary skill in the art to incorporate the Takeichi cleaning device comprising a lubricant applying device as the cleaning device in the image forming apparatus in the full-color image forming method rendered obvious over the teachings of Kitani, as

evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, and Shimizu, such that the lubricant applying device applies a fatty acid metal salt, such as zinc stearate, to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images over a long period of time.

13. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Kashimura, as applied to claims 1 and 2 above, further combined with Takeichi.

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Kashimura renders obvious a full color image forming method as described in paragraph 11 above, which is incorporated herein by reference.

Kitani does not exemplify the step of applying a surface energy reducing agent as recited in the instant claims. However, according to Kitani, after transferring the superimposed toner images to a recording material, the

photoreceptor drum **14** can be cleaned with a cleaning device **13** to remove toner remaining on the photoreceptor drum. Col. 2, lines 38-40; and col. 10, lines 32-33.

Takeichi discloses a lubricant applying device that is capable of constantly applying a lubricant, such as a fatty acid metal salt, e.g., zinc stearate, to the surface of the image carrier, i.e., the photoreceptor drum, in an image forming apparatus without any waste. The discussion of Takeichi in paragraph 12 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to incorporate the Takeichi cleaning device comprising a lubricant applying device as the cleaning device in the image forming apparatus in the full-color image forming method rendered obvious over the teachings of Kitani, as evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, Shimizu, and Kashimura, such that the lubricant applying device applies a fatty acid metal salt, such as zinc stearate, to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images over a long period of time.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Takeichi, as applied to claim 4 and 5 above, further combined with US 3,717,409 (Hespenheide).

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Takeichi renders obvious a full color image forming method as described in paragraph 12 above, which is incorporated herein by reference.

Takeichi does not exemplify a lubricant as recited in instant claim 16. However, as discussed in paragraph 12 above, Takeichi teaches that the dry solid lubricant can be zinc stearate and similar fatty acid metal salts. Col. 7, line 61.

Hespenheide teaches that typical dry solid lubricants that can be applied to the photoreceptor to reduce the friction of the photoreceptor and a cleaning member include metal salts of fatty acids such as, in addition to zinc stearate, magnesium stearate and aluminum palmitate, which are within the compositional limitation recited in instant claim 16. Col. 3, lines 47-57.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Hespenheide, to

use the equivalent magnesium stearate or aluminum palmitate as the dry solid lubricant in the cleaning device disclosed by Takeichi. It would have also been obvious to that person to use the resultant cleaning device in the image forming apparatus in the full-color image forming method rendered obvious over the teachings of Kitani, as evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, Shimizu, and Takeichi, such that the lubricant applying device applies the lubricant magnesium stearate or aluminum palmitate to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images over a long period of time.

15. Claims 20, 26-29, 31, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu, as applied to claims 1, 7-10, 12, 17, and 18, above, further combined with US 6,296,980 B1 (Oshiba).

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, and Shimizu renders obvious a full color

image forming method as described in paragraph 10 above, which is incorporated herein by reference.

Kitani does not disclose that its toner particles meet the particle size distribution requirement recited in instant claim 20. The Kitani toner particles are produced by a melt-kneading-pulverization-classification method. Kitani, col. 11, lines 37-41. As discussed in paragraph 10 above, each of the toners comprises toner particles having a volume average particle size of 8.5 μm.

Oshiba teaches a toner that has: (1) a "variation coefficient of shape coefficient" of not more than 16 percent; (2) a "number variation coefficient in the number particle size distribution" of not more than 27 percent; and (3) that comprises at least 70 percent of the toner particles in the sum (M), where sum (M) is the sum of the relative frequency (m_1) of toner particles included in the highest frequency class and the relative frequency (m_2) of toner particles included in the second highest frequency class of the toner in a histogram showing the number based particle size distribution, where the natural logarithm ln(D), where D(μm) is the diameter of the toner particles, is taken as the abscissa and the abscissa is divided into a plurality of classes at intervals of 0.23, and the number of particles is used as the ordinate. Col. 2, lines 22-27

and 40-50. The third Oshiba toner property meets the particle distribution limitation recited in instant claim 20. According to Oshiba, when the toner comprises a value of M of at least 70 percent, "the variance of the particle size distribution of toner particles narrows. As a result, by employing said toner in an image forming process, the minimization of generation of selective development may be secured." Col. 18, line 66, to col. 19, line 4. Oshiba further teaches that the toner having the above described properties (1) to (3) exhibits excellent developability and fine line reproducibility, and forms high quality images over a long period of time. Col. 2, lines 16-20; and Toner production example 7 at col. 28, and toner 85 in Tables 1 and 3. Oshiba teaches that toner particles having the above described properties can be obtained from a melt-kneading-pulverization method, where the toner particles are sprayed into a heated air flow or are repeatedly subjected to an application of mechanical energy in a gas phase employing an impart force. Col. 8, lines 55-61; Toner production example 7; and toner 85 in Tables 1 and 3.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Oshiba, to further treat the Kitani black and color toner particles as taught by Oshiba, such that the resulting toner particles have the three

properties described by Oshiba, wherein the toner particles have a value of M of at least 70 percent as recited in instant claim 20. It would have also been obvious to that person to use the resultant toner particles in the full-color image forming method rendered obvious over the teachings in Kitani, as evidenced by applicants' admission I, combined with the teachings in Kanbayashi, Tsuda, and Shimizu. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that provides high quality full color images having the properties disclosed by Oshiba.

16. Claims 21, 22, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Oshiba, as applied to claim 20 above, further combined with Kashimura.

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Oshiba renders obvious a full color image forming method as described in paragraph 15 above, which is incorporated herein by reference.

Kitani does not exemplify the use of a photoreceptor drum having a surface layer as recited in instant claims 21, 22, and 38.

Kashimura teaches a photoreceptor drum that comprises a surface layer that comprises about 54 wt% of a fine tetrafluoroethylene/hexafluoropropylene copolymer powder based on the weight of the binder resin. The Kashimura surface layer has a contact angle to water of 112 degrees. The discussion of Kashimura in paragraph 11 above is incorporated herein by reference. The Kashimura surface layer meets the surface layer limitations recited in instant claims 21, 22, and 38.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings in Kashimura, to use the Kashimura photoreceptor drum as the photoreceptor drum in the full-color image forming method rendered obvious over the teachings in Kitani, as evidenced by applicants' admission I, combined with the teachings in Kanbayashi, Tsuda, Shimizu, and Oshiba. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that provides superior quality full-color images as disclosed by Kashimura.

17. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and

Oshiba, as applied to claim 20 above, further combined with Takeichi.

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, and Oshiba renders obvious a full color image forming method as described in paragraph 15 above, which is incorporated herein by reference.

Kitani does not exemplify the step of applying a surface energy reducing agent as recited in the instant claims. However, according to Kitani, after transferring the superimposed toner images to a recording material, the photoreceptor drum **14** can be cleaned with a cleaning device **13** to remove toner remaining on the photoreceptor drum. Col. 2, lines 38-40; and col. 10, lines 32-33.

Takeichi discloses a lubricant applying device that is capable of constantly applying a lubricant, such as a fatty acid metal salt, e.g., zinc stearate, to the surface of the image carrier, i.e., the photoreceptor drum, in an image forming apparatus without any waste. The discussion of Takeichi in paragraph 12 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to incorporate the Takeichi cleaning device comprising a lubricant applying device as the cleaning device in the image forming apparatus in the full-color image forming

method rendered obvious over the teachings of Kitani, as evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, Shimizu, and Oshiba, such that the lubricant applying device applies a fatty acid metal salt, such as zinc stearate, to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images over a long period of time.

18. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, Oshiba, Kashimura, as applied to claims 20 and 21 above, further combined with Takeichi.

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, Kashimura, and Oshiba renders obvious a full color image forming method as described in paragraph 16 above, which is incorporated herein by reference.

Kitani does not exemplify the step of applying a surface energy reducing agent as recited in the instant claims. However, according to Kitani, after transferring the

superimposed toner images to a recording material, the photoreceptor drum **14** can be cleaned with a cleaning device **13** to remove toner remaining on the photoreceptor drum. Col. 2, lines 38-40; and col. 10, lines 32-33.

Takeichi discloses a lubricant applying device that is capable of constantly applying a lubricant, such as a fatty acid metal salt, e.g., zinc stearate, to the surface of the image carrier, i.e., photoreceptor drum, in an image forming apparatus without any waste. The discussion of Takeichi in paragraph 17 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to incorporate the Takeichi cleaning device comprising a lubricant applying device as the cleaning device in the image forming apparatus in the full-color image forming method rendered obvious over the teachings of Kitani, as evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, Shimizu, Oshiba, and Kashimura, such that the lubricant applying device applies a fatty acid metal salt, such as zinc stearate, to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images

over a long period of time.

19. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, Oshiba, and Takeichi, as applied to claims 23 and 24 above, further combined with Hespenheide.

Kitani, as evidenced by applicants' admission I, combined with Kanbayashi, Tsuda, Shimizu, Oshiba, and Takeichi renders obvious a full color image forming method as described in paragraph 17 above, which is incorporated herein by reference.

Takeichi does not exemplify a lubricant as recited in instant claim 16. However, as discussed in paragraph 17 above, Takeichi teaches that the dry solid lubricant can be zinc stearate and similar fatty acid metal salts. Col. 7, line 61.

Hespenheide teaches that typical dry solid lubricants that can be applied to the photoreceptor to reduce the friction of the photoreceptor and a cleaning member includes metal salts of fatty acids such as, in addition to zinc stearate, magnesium stearate and aluminum palmitate, which are within the compositional limitation recited in instant claim 16. Col. 3, lines 47-57.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Hespenheide, to use the equivalent magnesium stearate or aluminum palmitate as the dry solid lubricant in the cleaning device disclosed by Takeichi. It would have also been obvious to that person to use the resultant cleaning device in the image forming apparatus in the full-color image forming method rendered obvious over the teachings of Kitani, as evidenced by applicants' admission I, combined with the teachings of Kanbayashi, Tsuda, Shimizu, Oshiba, and Takeichi, such that the lubricant applying device applies the lubricant magnesium stearate or aluminum palmitate to the surface of the photoreceptor drum during cleaning. That person would have had a reasonable expectation of successfully obtaining a full-color image forming method that prevents the wear of the photoreceptor drum such that the method provides desirable full-color images over a long period of time.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. Nam Nguyen, can be reached on (571) 272-1342. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to

Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Janis L. Dote
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PRIMARY EXAMINER
GROUP ~~1500~~ 1700

JLD
Feb. 23, 2006